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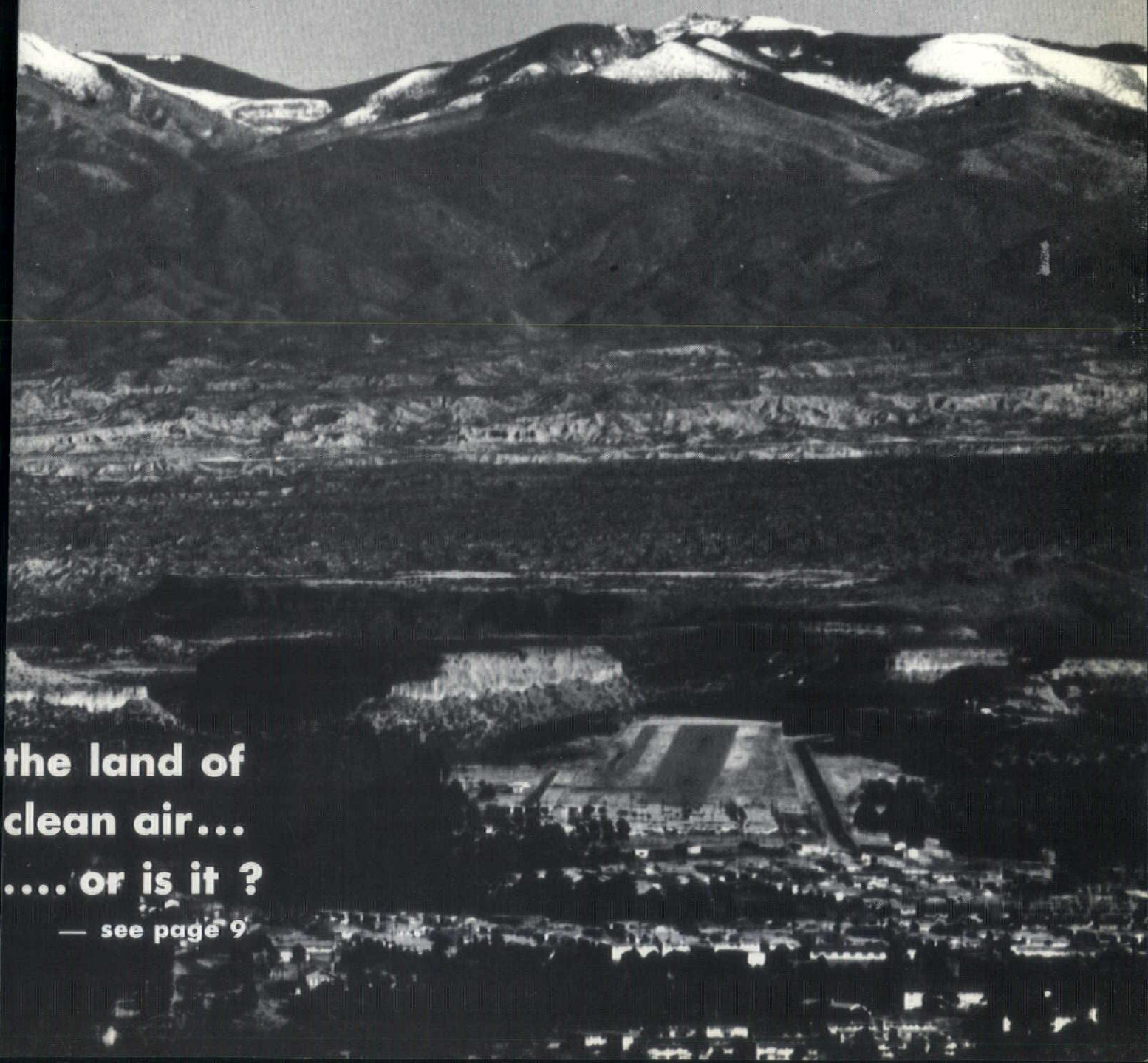
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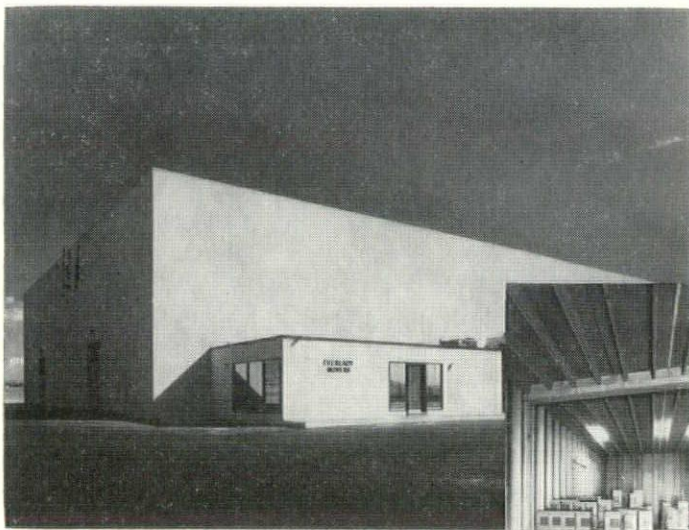
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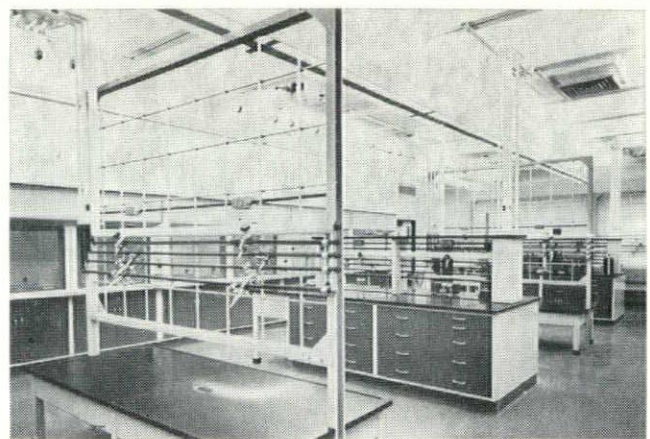
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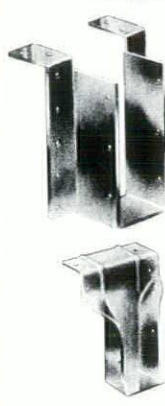
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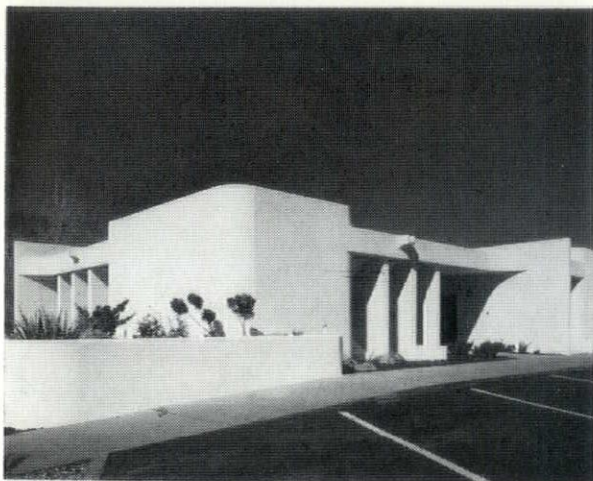
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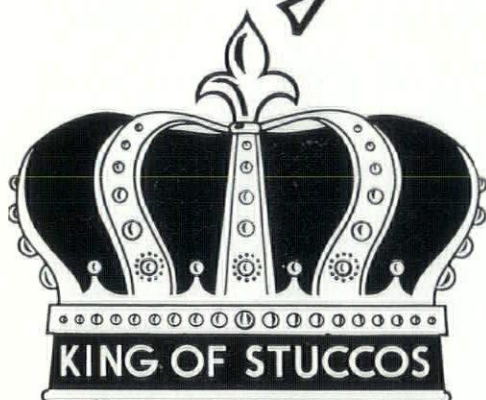
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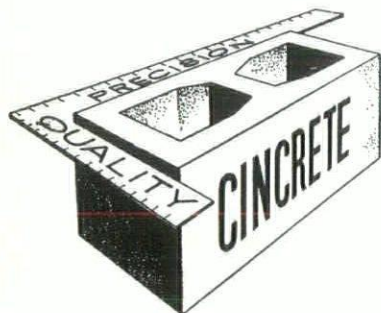
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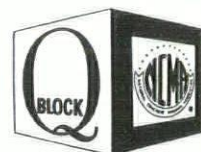
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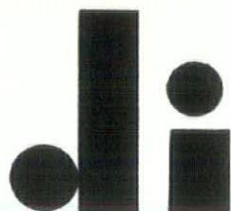
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# New Mexico's Air and Water

## the endangered essentials.

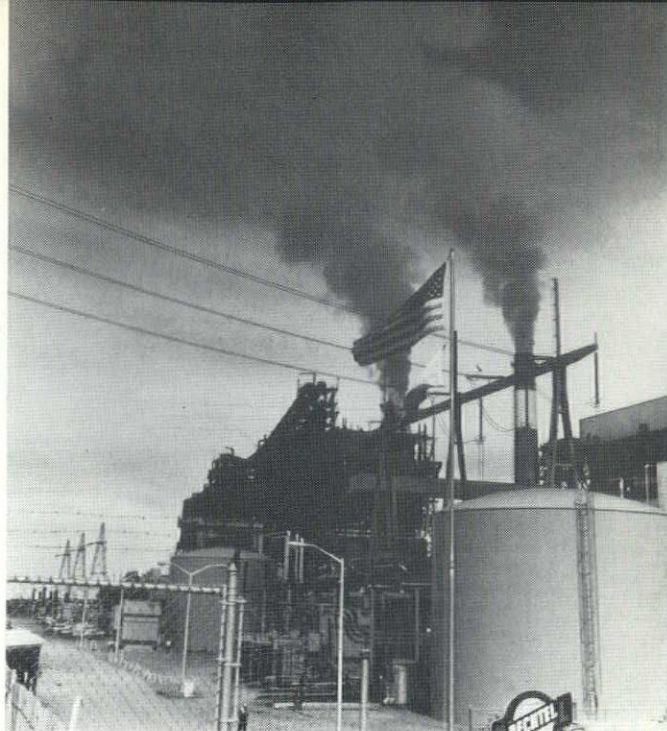
— Harvey Mudd II

A Federal air pollution control official stated recently, "There is no clean air left in the United States." New Mexico is no exception: smog, that noxious price of progress, has arrived in New Mexico, as anyone who has been here long enough to remember how it was before can testify—days so clear that Mt. Taylor could be seen from Albuquerque and San Antonio Mountain was sharp and clear from Tesuque Hill. Those days are rare now. And the day is coming when the Sandia Crest will barely be visible from downtown Albuquerque—the day will come unless New Mexicans take an unequivocal stand about what they value in the Land of Enchantment.

New Mexico's surface water is among the cleanest in the continental United States. It is still possible to find streams that carry no man-made contamination in the Pecos or the Gila Forests. Even the upper Rio Grande is relatively clean. There is no guarantee, however, that such situation will not change under the pressures of increased population and industrial development. It must not be allowed to change.

### Air

A quick look at the air and water situation as it stands now: air in New Mexico is contaminated by 1,597,336 tons of pollution annually. Of this figure, transportation, the ubiquitous automobile, accounts for fully 50%; industrial processes account for 31%; this includes oil and gas production in the southeast counties, copper smelting in the Deming-Silver City area, and sawmills in most mountainous areas, most conspicuously in the Espanola and Alamogordo areas. Power generation accounts for approximately 10% of the statewide total, some 164,741 tons per year at the present rates of activity. There is one significant source of power generation pollution in the state—the Arizona Public Service Company/New Mexico Public Service Company facility near Farmington. These coal burning plants generate some 290 tons of fly ash per day—although only 10% of the state's air pollution total comes from the Farmington facility, fully 64% of all the particulates (airborne solid wastes) of the state are generated by this one activity. The fly ash is spread by prevailing westerlies into the upper Rio Grande Valley where it becomes the major factor in reducing visual range and the general quality of the views. The blue haze that is so prevalent from Albuquerque to Taos is attributable to the fly ash. It has been tracked by air into these areas; a satellite photograph shows the plume stretched from Farmington all the way to San Luis, Colorado. Monitoring devices set up at Los Alamos by the Arizona Public Service Company detected



Arizona Public Service Co./New Mexico Public Service Co.  
plant near Farmington, N. M.

Photograph by Jon Samuelson

the fly ash. However, industry spokesmen have made no statement concerning the quantities which were found. In addition to the fly ash, sulphur dioxides and oxides of nitrogen are pollutants from the Four Corners power plant. The remaining 9% of the state's air pollution is contributed by miscellaneous burning processes; public dump burning is a major contributor.

### Water

The Health & Social Services Department indicates that some 200 miles of New Mexico streams are degraded due to inadequate or improperly operated municipal sewage plants. It is estimated that some 280 industrial and business operations contribute to the contamination of streams. The most notable example of a water polluter is the Molybdenum Corporation of America's mine and processing plant at Questa. Consisting of a slurry of fine sand and small quantities of cyanide, the mill waste is transported by pipe from the mill site in the Red River Canyon to settling ponds west of Questa. The silt settles out and the decanted waters, including dissolved chemicals, are allowed to enter the Red River. However, because of the abrasive qualities of the slurry, the transport pipes break, frequently spilling large quantities of waste into the Red River and eventually the Rio Grande.

Bureau of Land Management officials believe that these breaks may affect fish populations in the Red River. Moly Corp officials state that the decanted water is pure enough to drink: the fact remains, however, that the decant pond, named Turquoise Lake in an attempt to turn it into a recreation area, will not support trout. The Moly Corp has requested permission to dump decant wa-



ter into the wild river section of the Rio Grande; the Bureau of Land Management, which administers the Wild Rivers Act, has at both the state and Washington levels turned down the request. It is technically feasible for the Moly Corp to reuse the decanted water at a capital cost of only one to two per cent of the present capital investment.

Agricultural runoff containing chemical fertilizers and pesticides is becoming another major source of surface water pollution.

New Mexico's ground water supplies are not in good condition. Of 330 public water supplies in the state, 124 failed to meet United States Public Health Service standards for chemical content; nearly a half of the total of 330 failed to meet biological standards. Increased use of ground waters will inevitably result in the lowering of water tables, and the spoilage, through the intrusion of brackish waters, of many small private wells.

Of greater significance in discussing New Mexico's water is the matter of total supply. The state has 2.5 million acre feet available annually. Environmental Services Division of New Mexico Health and Social Services estimates that at present rates of agricultural use, this quantity will support a population of 1.5 million people, only 500,000 more than the present population. Long-range state planning should be begun with reference to that figure.

The satellite cities which are planned for the Santa Fe area have given little or no attention to the question of over-all state water supply. The water resources of New Mexico are finite, a fact which may work to the state's advantage in setting the limits of its population.

Another pollution problem which will require farsighted planning is that of solid wastes. The 3 million daily pounds of refuse generated now require some 200 acres per year in sanitary land-fill operations. That figure, it is estimated, will increase to 500 acres per year by the year 2000. As long as this disposal method is used, land-fill operations must be steered into appropriate areas, areas that have no better social potential.

Ultimately, however, the method must be abandoned in favor of a system which requires reuse of the raw material contained in our solid waste. The American one-use-only approach to materials is profoundly wasteful and, at the same time, environmentally destructive. The world's supply of unreplenishable raw material, iron, virgin forest, hydrocarbon fuels, etc.—is diminishing rapidly as our demand for material goods expands. And, at the other end of a product's life, the vast quantity of American junk imposes severe economic and psychological stresses on our society. The only way out of this double bind is to recycle.

### **The Air Standards**

The quality of New Mexico's environment is and will be controlled by the degree of public concern. The standards promulgated by the state's De-

partment of Health & Social Services, and the laws enacted by the legislature reflect that degree of concern.

New Mexico's air quality standards and regulations, which went into effect 26 February, 1970, are relatively good as a result of a rather substantial amount of citizen's concern and expertise that was demonstrated at the public hearings last September and October. On the positive side, New Mexico emissions' regulations are strict, but not economically prohibitive, when dealing with the emissions from asphalt plants (except portable plants), gypsum plants, cement plants and coal-burning power plants. The fly ash emissions from the Four Corners power plants will, therefore, have to be controlled 99% by 1 January, 1972, in the case of Units 1, 2, 3 and 6, and by January, 1974, in the case of Units 4 and 5, which are now operating at 97%. This will reduce the present fly ash pollution to about one-fifth of the present problem. This is one of the best fly ash emission (particulates) standards in the nation. There is no sulphur-dioxide ( $\text{SO}_2$ ) emission regulation in the state. The regulation for hydrogen-sulphide emissions from paper pulp mills is the most stringent in the nation; even with this standard, however, odors would be detectable two miles from a plant. There are no emission regulations for perlite plants or for copper smelters, a major source of sulphur-dioxide emissions.

The regulation concerning sawmill wood waste burners is adequate. It will require some improvement of incinerator performance on all presently operating units. Any unit operating after January 1, 1975, will be required to operate at much higher standards (measured in terms of smoke density). The eventual goal is to phase out this wasteful method of disposing of the sawmill by-products. Open burning of trash is now prohibited in New Mexico except in the case of communities under 5,000 in population with no public refuse collection service. Certain forestry and agricultural uses of fire, along with the fireplace and the barbeque, are also exempted.

New Mexico also defined ambient air-quality standards (a measure of the overall quality of our air) in the case of particulates and  $\text{SO}_2$ . Ambient air standards simply set limits, for particular pollutants, beyond which the air will be considered polluted. These limits can be used to justify tightening of emission regulations. Only emission regulations can be used to control pollutants issuing from a specific source. New Mexico ambient air standards for particulates are scandalous considering the existing relatively high quality of our air. It allows an annual geometric mean of 60 micrograms per cubic meter which, if achieved, reduces visibility to a mere 15 miles. New Mexico's natural background particulate levels probably run around 27 micrograms per cubic meter; the existing standard allows, then, significant deterioration of existing air quality. The sulphur-dioxide standard is equally bad.



At .03 parts per million, New Mexico has actually accepted a standard less stringent than those proposed by the cities of St. Louis and Kansas City. At .03 parts per million, adverse effects to plant life and human health have been noted.

The air quality standards and regulations can be strengthened at subsequent hearings before the Health Board. The ambient air quality standards for particulates must be strengthened if we are to protect our views, a basic right of our citizens and an important resource for the tourist industry. A figure of around 35 micrograms per cubic meter would be more appropriate for New Mexico. The sulphur-dioxide ambient air standard must be lowered to .015 parts per million to provide minimal health protection.

Sulphur-dioxide, incidentally, combined with air-borne water vapor becomes sulphuric acid ( $H_2SO_4$ ) and thereby a major maintenance problem for many building materials:  $H_2SO_4$  is corrosive to most materials, including human lungs. The ambient sulphur-dioxide level in the San Juan Basin is already exceeding the state standard because of the power plants. New Mexico Citizens for Clean Air and Water, a citizen's group which participated most actively in the standards' hearing, also recommends that visibility standards be set that will define the air as polluted when the absolute visual range is reduced to a certain point — perhaps 100 miles. Emission regulations must be included for sulphur-dioxide and oxides of nitrogen; and the regulations must be expanded to cover industries not now included, such as the copper smelters in the south.

WORK FOR THE FUTURE.

### The Air Law

The 1970 legislature made some promising amendments to the Air Quality Control Act. The New Mexico law now has some teeth in it, which its "lobbied to death" predecessor lacked. Some improvements are found in the definitions: visibility is now specifically included as a component of the public welfare which must be protected. The word "will" was replaced by "may" in the section which described polluted air as air which "...will, with reasonable probability, damage health, etc..." This is a significant improvement from the legal point of view, in that less ironclad evidence is needed by

the Health Department or the citizen in establishing a reason to act against a polluter. The language of the new law, "may...damage health" allows action before there has occurred damage to the citizens of the state. The old language, "will damage" essentially allowed industry to avoid being called a polluter until there was already irreversible deterioration in the air and in the health of the citizen: The old "don't move until there is a crisis" syndrome.

Another positive point was the consolidation of the provision for mandatory public hearings, with rights of citizen participation, for all regulation changes and requests by industry for permission to operate below air quality regulations under a variance. Attempts to include noxious odors in the definitions were defeated by cattle interests who feared for the sanctity of their feed lots.

The 1970 bill made some improvements in the enforcement and penalty section of the act. The tools

now available to the Health and Social Services Department and to the citizens include the use of a court injunction against a polluter, a provision for civil penalties of up to \$1,000 per day of violation, a petty misdemeanor provision for such lesser environmental infractions as illegal open burning and removal of an automobile smog control device. The previous act only provided for injunctive relief. The weakness here is in the low "up to \$1,000 per day" fine. It is inadequate for large polluters such as the utilities. An early version of the bill contained a fine of up to \$5,000 per day, a level

found in many states, until a final vote of the bill, when a floor amendment introduced by Alfonso Montoya caused it to be reduced to \$1,000 per day. Future sessions of the legislature must elevate the upper limits of the fine structure so as to be a meaningful penalty for the large offender.

Another job for the next legislative session is to establish the permit system in the state. A permit system allows some control over a new industry before it becomes a pollution problem. Under this system, the industry has to satisfy the Health and Social Services Department that its methods of pollution control are adequate to prevent harmful emissions before it can proceed with construction of the plant. In the long run, this will save the industry money—by avoiding legal battles with Health and Social Services if their methods prove unsatis-

The environmental issues that confront New Mexico, the United States, and ultimately, the human race, are, in the final analysis, far broader than questions of specific contaminants and the regulations for their control. The ultimate concerns must be centered around an understanding of man's relationship with the planet Earth and his right to a clean, healthy, and ecologically balanced environment. It is now necessary to ask fundamental questions concerning the rights of man on this Earth and about our attitudes toward population growth and industrial expansion. *New Mexico Architecture* suggests that its readers put some of these questions to the two candidates for Governor. A post card is provided for these questions. It is hoped that Mr. Bruce King and Mr. Pete Domenici will make a public answer to these questions.

**Please send these post cards today!**





factory, and by avoiding costly remodeling to meet air quality requirements. The permit system also gives HSS greater control over all sources in the state. The permit system was lost in the last session because the Health and Social Services Department did not feel itself financially or otherwise equipped to administer the program. Adequate funding is a continuing problem—it is a fight which will occur at each session. In the last session, a record \$250,000 for pollution control was appropriated; however the over-all HSS budget was cut drastically, which reduces the effectiveness of the appropriation.

#### **Water Standards and Law**

New Mexico's water quality standards are adequate, but could use strengthening. They lack any standard for turbidity (water clarity), one of the pollution effects of the Moly Corp's spills. Increased turbidity in the Red River may have a detrimental effect on fish feeding ability, on the overall life quality of the stream, and, of course, on the tourist industry of the area which must count on good fishing as an asset. The "emission regulations" in dealing with water are measured in chemical oxygen demand (COD) and biological oxygen demand (BOD). The COD standard of 50 parts per million is now being violated by the municipal sewage plants in the City of Albuquerque.

Public hearings are now mandatory in any proceeding in which the city would request permission to continue operation under a variance.

In the last session of the legislature much of what was done to improve the Water Quality Control Act was identical to what was done for the air law; the establishment, for example, of a fine of up to \$1,000 per day in civil penalties. In the case of water, this fine is even more obviously inadequate than in the case of air. Difficult to dispose of pollutants can be held in holding tanks by an irresponsible industry, and then the accumulation of many days or weeks is "accidentally" discharged into the stream in one shot, at the low cost of only \$1,000. The permit system must be incorporated in the water law as well as into the air law. One forward step made in the last legislative session was

the addition of a "private citizen" to the seven-member Water Quality Control Board (Variance Board). Citizen participation in environmental decisions is essential since most government agencies are either too politically confined or too tied to private industry to provide the kind of active disinterested input into the decision-making process. Governor Cargo has appointed a University of New Mexico biologist who is also retained as a consultant by New Mexico Public Service Company. This is hardly what the conservationist had in mind when he asked that a private citizen be included on the board.

THERE IS ABSOLUTELY NO REASON FOR NEW MEXICO'S AIR AND WATER TO DETERIORATE FURTHER.

We start out relatively clean, and, with vigilance and foresight, we can stay that way. The existing problems, such as the power plants and the sawmills, are neither so serious nor entrenched that they cannot be at least partially corrected. The job of protecting our exceptional environment falls as much to the private citizen as it does to state and Federal agencies; for, in essence, government only can do what the citizen demands that it do. Those who are involved in the development of the state, architects, developers, builders, have a special responsibility, for their effect on the future quality of our environment will be more marked than the average citizen. We must be aware that today's haste, carelessness, excessive concern for profits and cost, or simple ignorance, become, invariably, tomorrow's environmental problem. Economic development at the cost of beauty and health of New Mexico's natural environment, is not good economy—the cost to the public health, to the psychological well-being of the human part of the economy, and the damage to our life support system, are factors which our planners and developers must consider. Foresight, care and environmental awareness must be a part of the development of the Land of Enchantment.

—Harvey Mudd II

#### *Primary Source of Data:*

*Environmental Services Division, New Mexico Department of Health and Social Services Department.*





## The Sangre de Cristo

### Mountains . . . .

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This view was taken in 1968. The cover photograph was taken just 8 years previously—from the same spot, at the same time of the day and year. Photographer: Bill Regan.

Area of Cover  
Photograph

## What you can do!

### Household Cleaners Rated on Phosphate

The following list of household cleaners rated for their phosphate content was prepared by the Pollution Probe group of the University of Toronto, Canada, and published by ECO Bulletin, Emmaus, Pa., 18049, which will provide additional copies on request.

Pollution Probe urged consumers to use soap or low-phosphate cleaners. High phosphate products have a higher pollution potential.

The cleaning agents were analyzed in a University of Toronto laboratory. Estimated error is plus or minus 10 per cent of the figure shown, e.g., if the figure is 40 per cent the actual value could lie anywhere between 36 and 44 per cent. All liquid dish detergents tested had less than 1 per cent phosphate.

#### HEAVY DUTY LAUNDRY DETERGENTS

| Product                    | Per Cent Phosphate | Manufacturer            |
|----------------------------|--------------------|-------------------------|
| Amway Trizyme              | 52.5               | Amway Corp.             |
| Bio-Ad                     | 49.0               | Colgate Palmolive       |
| Peri                       | 47.0               | Sep-Ko Chemicals        |
| Cheer                      | 44.5               | Proctor & Gamble        |
| Oxydol                     | 44.5               | Proctor & Gamble        |
| Tide XK                    | 43.5               | Proctor & Gamble        |
| Drive                      | 41.5               | Lever Bros.             |
| All                        | 39.0               | Lever Bros.             |
| ABC                        | 37.5               | Colgate Palmolive       |
| Sunlight                   | 37.00              | Lever Bros.             |
| Amway SAB                  | 36.5               | Amway Corp.             |
| Fab                        | 36.5               | Colgate Palmolive       |
| Arctic Power               | 36.5               | Colgate Palmolive       |
| Ajax 2                     | 36.0               | Colgate Palmolive       |
| Omo                        | 36.0               | Lever Bros.             |
| Duz                        | 35.0               | Proctor & Gamble        |
| Bold                       | 31.5               | Proctor & Gamble        |
| Surf                       | 32.5               | Lever Bros.             |
| Breeze                     | 32.0               | Lever Bros.             |
| Amaze                      | 27.0               | Lever Bros.             |
| Bestline B-7               | 27.0               | Bestline Products, Inc. |
| Explore                    | 26.0               | Witco Chemical Co.      |
| Meleco Laundry Detergent   | 25.0               | Malco Products, Inc.    |
| Wisk                       | 10.5               | Lever Bros.             |
| Tend Maskintvatt (Swedish) | 8.0                | AB Hetios               |

#### Laundry Soaps

|                        |               |                  |
|------------------------|---------------|------------------|
| Instant Fels           | 9.0           | Purex Corp.      |
| Lux                    | less than 1.0 | Lever Bros.      |
| Maple Leaf Soap Flakes | less than 1.0 | Canada Packers   |
| Ivory Snow             | less than 1.0 | Proctor & Gamble |

#### Dishwasher Compounds

|                                     |      |                  |
|-------------------------------------|------|------------------|
| All                                 | 45.0 | Lever Bros.      |
| Finish                              | 43.0 | Economics Labs.  |
| Calgonite                           | 42.0 | Calgon           |
| Cascade                             | 36.5 | Proctor & Gamble |
| Amway Automatic Dishwasher Compound | 34.0 | Amway Corp.      |
| Swish                               | 29.0 | Curley Corp.     |

#### Light Duty Compounds (Laundry and other uses)

|                             |               |                      |
|-----------------------------|---------------|----------------------|
| Dreft                       | 34.0          | Proctor & Gamble     |
| Zero                        | 7.5           | Boyle Midway         |
| Explore Liquid              | less than 1.0 | Witco Chemical Co.   |
| Bestline Liquid Concentrate | less than 1.0 | Bestline Prod., Inc. |
| Nutri-Clean OLC             | less than 1.0 | Con-Stan Industries  |

#### Miscellaneous

|                            |               |                     |
|----------------------------|---------------|---------------------|
| Calgon (water conditioner) | 75.5          | Calgon              |
| Amway Water Softener       | 73.5          | Amway Corp.         |
| Solvease                   | 23.0          | Russel Chem. Co.    |
| Snowy Bleach               | 22.5          | Harold Schafer Ltd. |
| Spic and Span              | 21.0          | Proctor & Gamble    |
| Mr. Clean                  | 6.5           | Proctor & Gamble    |
| Ajax All-Purpose           | 6.5           | Colgate Palmolive   |
| Arm & Hammer Sal Soda      | 1.0           | Church & Dwight     |
| Fleecy                     | less than 1.0 | Bristol Myers       |
| Javex Bleach               | less than 1.0 | Bristol Myers       |
| Whistle                    | less than 1.0 | Bristol Myers       |
| Jet Spray                  | less than 1.0 | Economics Labs.     |
| Lestoil                    | less than 1.0 | Noxema              |
| Downy                      | less than 1.0 | Proctor & Gamble    |
| Dutch Bleach               | less than 1.0 | Purex Corp.         |
| Lawsons Borax              | less than 1.0 | Bristol Myers       |
| Pinesol                    | less than 1.0 | Cynamid             |

Reprint from the Denver Post April 5, 1970

While not among the products tested by Pollution Probe group of the University of Toronto, the Shaklee Products Co., Hayward, California, has provided us with an analysis of the phosphate content of its laundry detergent Basic-L. A study prepared by "an independent government licensed research laboratory" determined the phosphate content to be "less than 0.1 parts per million."

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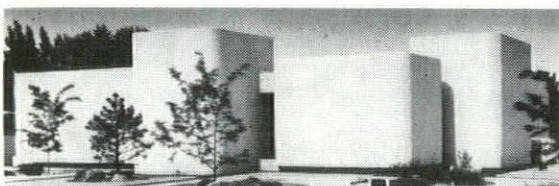
Billboards and junkyards. A look at where-we-are on implementing the New Mexico Highway Beautification Act of 1966.



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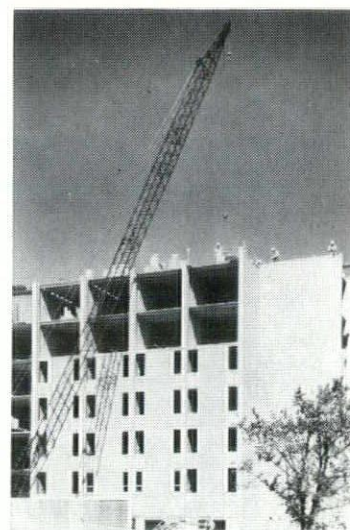


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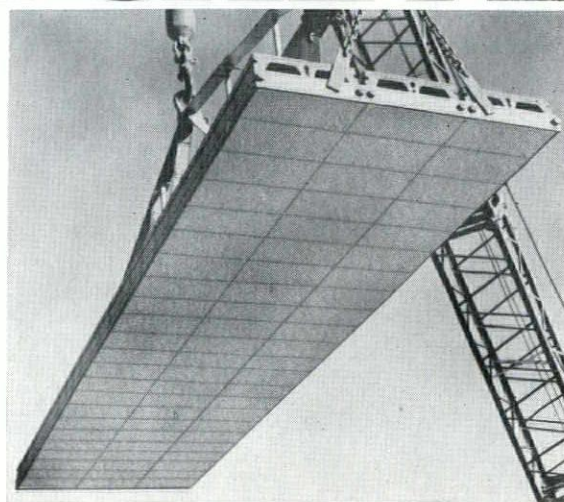
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# WHY SHOULD ARCHITECTURAL FEES GO UP?

"It is easy for us as contractors to tell when an architect is receiving a substandard fee" according to Bob Lockwood in a recent conversation. Bob, who is President of the New Mexico Building Branch of the Associated General Contractors went on to say, "Substandard architectural fees result in low quality plans and specifications."

Low quality plans and specifications cause problems for owners and architects, as well as for contractors, but the contractor is likely to submit a higher bid to take care of these problems. The owner who is truly concerned about the final building he receives will not try to cut his architect's fee by 1 or 2% of the total construction cost because he realizes that poor architectural services may increase his construction costs by more than 1 or 2%.

In February, 1968, the New Mexico Society of Architects published a new sliding fee schedule that reflected a general increase over the previously accepted 6% fee. The New Mexico Society of Architects spent a great amount of time in research and preparation in 1968 to derive the new fee schedule. Fee schedules from all over the country were studied, as were architectural costs in New Mexico. The final recommended fees, as published at the end of this article, (page 19) are still somewhat below the average fees across the nation.

Many architects and many clients are using the 1968 fee schedule, and they are finding the results to be most successful. A partial list of building owners using the 1968 Fee Schedule is available from this writer on request.

The architect has a very serious responsibility "to safeguard life, health, and property, and to promote public welfare" in New Mexico. The phrase in quotation marks is taken from the first sentence in the New Mexico Architectural Law. When a building owner selects his architect, he is selecting a person who will be responsible for properly spending the large sum of money the owner will invest in his new building. He is also selecting a person who is responsible for designing a building to safeguard the life, health, and property of everyone who uses that building.

Unlike many groups, the architectural profession does not have the benefit of union organization or state law to determine compensation. School teachers have the right of withholding services to bargain for higher compensation. Building trade members have the right to strike for higher compensation. In the case of building trades, the amount of compensation they receive becomes law on public-funded projects and this law is incorporated into the architects' specifications on each building project. When their compensation is increased, the contractor passes the increase on to the building owner in the form of higher bids.

Federal anti-trust laws do not permit the AIA

## Joe Boehning, AIA - President, New Mexico Society of Architects

to regulate compensation as the unions can do. This is proper as architects are professionals and should not be in a position to force clients to pay a minimum fee. They should, however, receive compensation commensurate with the services they are called upon to provide.

It is natural to assume that since building costs have increased, the increased compensation based upon a percentage type fee should take care of the increased costs incurred by the architect. The increase in building costs is the direct result of inflation, and the resultant increase in architects' fees only compensates the architect for his normal inflationary increases in expenses. They do not reflect an increase of services to the building owner; they merely indicate the degree of general inflation.

The degree of inflation can be illustrated with Table 1 showing a sampling of wages as determined by the State Labor Commissioner between November, 1965 and April, 1970.

TABLE 1

| TRADE       | NOV. 1965       | APRIL, 1970     |
|-------------|-----------------|-----------------|
| Bricklayer  | \$4.62 per hour | \$6.31 per hour |
| Carpenter   | 4.15 per hour   | 5.21 per hour   |
| Electrician | 4.68 per hour   | 5.60 per hour   |
| Plumber     | 4.48 per hour   | *5.51 per hour  |
| Iron Worker | 4.43 per hour   | 5.58 per hour   |

*\*A 46 day strike was settled in mid-June which grants plumbers an immediate \$1.50 an hour raise. An additional \$1.00 an hour will become effective April 1, 1971.*

If the architect today were not providing increased services over what he provided for his client twenty years ago, then the percentage of fee of twenty years ago would still be adequate at today's costs. This, however, is not the case for today's architect is called upon to produce much more complex and detailed plans.

The increase in services provided by the architect has been slow and gradual over the past twenty years, so slow, in fact, that it has almost gone un-noticed. Recently, however, the American Institute of Architects commissioned the management consultant firm of Case and Company to conduct a survey involving over 200 architectural firms (some in Albuquerque) to procure information concerning present day architectural practices. This study showed that profits of architectural offices are only one-third of what they were in 1950. Furthermore, the study shows that on one out of four projects, the architect loses money. How can an architect be expected to provide his best services under these conditions?

To illustrate how the services of the architect



have increased, a school designed in 1947 for the Bernalillo County School Board (now consolidated with Albuquerque Public Schools) will be used as an example. <sup>1</sup>The Ernie Pyle Junior High School, as originally built, had eleven classrooms and cost \$126,351.06. It is compared with a recent school of comparable size and cost—the <sup>1</sup>1969 Addition to Grants High School. The services and costs of these two structures are compared in Table 2. Architect's fees cannot be compared only by relating numbers of sheets of drawings and specifications, as in Table 2, but increased consultant fees must also be taken into account.

A set of documents, such as those for Ernie Pyle Junior High could not be put out for bids today. Today's competitive bidding among contractors requires much more detail and information on drawings and specifications. The lack of detail on the early drawings would make it impractical to

construct the building with present building techniques. If the Ernie Pyle documents were put out to bidders today, and if anyone would bid on them, they would result in higher costs because the lack of information would force bidders to make excessive assumptions.

For example, the Ernie Pyle heating system consisted of three furnaces controlled by three thermostats. This system is not acceptable by today's school standards which require individual classroom temperature control, and highly controlled classroom ventilation. The mechanical engineering fee for Ernie Pyle Junior High did not cost the architect more than \$100.00.

The plumbing design on the Ernie Pyle project merely consisted of locating plumbing fixtures on the architectural floor plan. No piping plans, venting plans, or plumbing details were required, and the architect paid no fee for design of the plumbing system on the Ernie Pyle project.

The Ernie Pyle structural system was a simple wood-joint roof system on bearing walls with continuous concrete footings. Today, such a structural

1. These documents are on file in the office of the writer and are available for inspection.

TABLE 2

|                                       | Ernie Pyle Jr. High<br>Actual Figures 1947<br>↓ | Ernie Pyle Jr. High<br>Estimated Costs for 1969<br>↓ | Additions to Grants<br>High School 1969<br>↓ |
|---------------------------------------|---|--|--|
| Site drawings                         | 1   |  | 1  |
| Structural drawings                   | 2   |  | 5  |
| Architectural drawings                | 3   |  | 7  |
| Mechanical drawings                   | 1   |  | 5  |
| Electrical drawings                   | 0   |  | 8  |
| Total number of sheets<br>of drawings | 7   |  | 26   |
| Number of pages of<br>specifications  | 37  |  | 118  |
| Construction cost                     | \$126,351.00                                    | \$230,000*   | \$237,648.00                                 |
| Fee at 5%                             |   | \$ 11,500  |  |
| Fee at 6%                             |   | \$ 13,800  |  |
| Fee at 7%                             |   | \$ 16,100  |  |
| Difference between 5%<br>and 7% fees  |   | \$ 4,600   |  |
| Structural Engineer fee               | \$ 75.00  |  | \$ 1,043.68                                  |
| Mechanical Engineer fee               | \$ 100.00                                       |  | \$ 1,697.60                                  |
| Electrical Engineer fee               | —0—   |  | \$ 1,146.00                                  |
| Total Consultant fees                 | \$ 175.00                                       |  | \$ 3,887.28                                  |

\*Based upon \$16.00 per square foot.



system would hardly be considered adequate for a school by either architect or engineer. The architect on the Ernie Pyle project paid no more than \$75.00 for this structural design.

The electrical design at Ernie Pyle merely consisted of locating such electrical equipment as lights, switches, outlets, etc., on the architectural drawings. Such a set of electrical drawings would not even pass the City Building Department today. There was no electrical engineer's fee for the architect to pay on the Ernie Pyle project.

As may be seen in Table 2, the consultant fees paid by the Architect rose from \$175.00 in 1947 to \$3,887.28 in 1969 on a comparable project. This represents an increase of \$3,712.28 which nearly absorbs the \$4,600.00 increase gained by changing the fee from 5% to 7%.

To summarize the financial effect on the architect for this type of additional service, one may point out that in 1952, the consulting engineering fees paid by the firm of A. W. Boehning, Sr., amounted to 10.4% of the gross income from fees. In 1969, the consulting engineering fees paid by the firm of Joe Boehning amounted to 37.2% of the gross income from fees.<sup>2</sup> Consulting engineers are not overpaid for the services they provide. It is not fair for an architect to ask his engineers to reduce their fees when his client refuses to pay standard fees.

Records indicating architect's time spent on architectural design twenty years ago are not available to this writer. I am convinced, however, that the architect today spends more time in programming and in schematic and preliminary design. There has been a tremendous increase in building materials and technology since 1950 and today's architect must spend more time studying and analyzing materials and systems in order to select the best solution for each project. Since mechanical, electrical, and structural systems are much more sophisticated, the architect today also spends more time coordinating these systems into the overall solution. As the results of these increased services, building owners today are getting buildings far superior to those constructed 20 years ago.

The Case Study, referred to above, also found the costs of personnel employed by architects have gone up at a more rapid rate than construction costs. These increases are shown in Table 3.

**TABLE 3**

Percentage Increase of Personnel Over Increase in Construction Costs

|               |                                    |
|---------------|------------------------------------|
| Sr. designer  | 12% higher than construction costs |
| Sr. draftsman | 13% higher than construction costs |
| Clerk         | 24% higher than construction costs |
| Bookkeeper    | 12% higher than construction costs |

2. These documents are on file at the office of the writer and are available for inspection.

The architect's costs for providing services on the previously mentioned additions to Grants High School amounted to \$15,945.33.<sup>3</sup> These costs include the consultant fees listed in Table 2, draftsmen's wages, principal's wages (for time spent on the project), inspector's wages, secretarial wages, and normal overhead items such as: 1) accounting and legal services; 2) blueprinting supplies; 3) donations; 4) dues; 5) subscriptions; 6) library; 7) office supplies; 8) drafting supplies; 9) business promotion; 10) taxes; 11) licenses; 12) telephone; 13) utilities; 14) insurance; 15) rent; and 16) office equipment and furniture such as mimeograph, typewriters, adding machines, drafting equipment, blueprint machine, photocopy machine, binding machine, etc.

Table 4 shows an analysis of a range of fees between 5% and 7% and shows that a difference of 1% (6% to 7%) on this particular project meant the difference between profit and loss for the architect.

**TABLE 4**

| Fee              | At 7%       | At 6%         | At 5%         |
|------------------|-------------|---------------|---------------|
| Fee              | \$16,635.36 | \$14,258.88   | \$11,882.40   |
| Costs            | 15,945.33   | 15,945.33     | 15,945.33     |
| Profit or (loss) | \$ 690.03   | (\$ 1,686.45) | (\$ 4,062.93) |

The standard architectural contract today calls for the client to pay the exact cost of reproduction of drawings and specifications that are required to provide the bidding contractors and major subcontractors with the information they need to compile their best bid. It is in the interest of the client to provide adequate drawings and specifications to bidders in order to obtain the best bid.

The preamble to the 1968 Fee Schedule states, "This schedule applies to all structures similar to respective types listed and represents a *fair fee below which adequate architectural services cannot be expected.*" (Emphasis placed by this writer.)

To those clients who want to "safeguard life, health, and property, and to promote public welfare," but are *not* paying adequate compensation to their architect, I humbly request that you honestly reconsider the fees you are paying with respect to the responsibilities you place on your architect. Are you receiving the best possible professional service for your fee?

To those architects who consistently attempt to provide architectural services for substandard fees, I sincerely request you to honestly review the value of your service. Are you consistently providing the best architectural services you possibly can?

— Joe Boehning, A.I.A.

3. Cost documents are on file at the office of the writer and are available for inspection.

**Schedule of Recommended Fees—**





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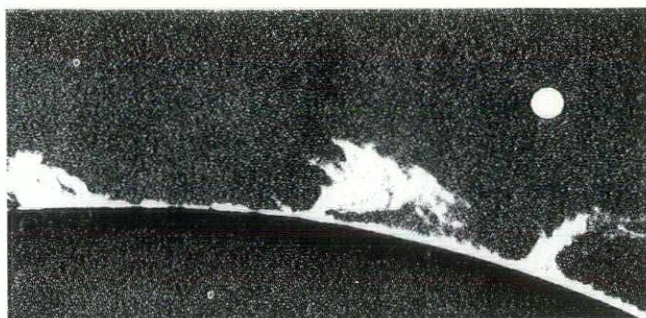
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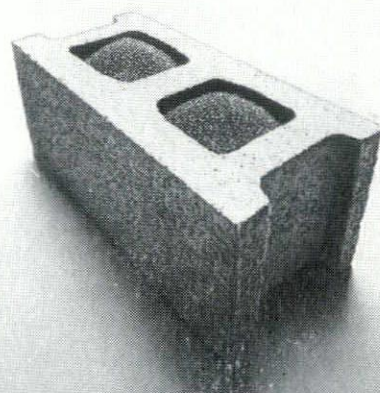
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|                                 | Heavyweight   | .33         | .17       |
| 8                               | Lightweight   | .53         | .36       |
|                                 | Heavyweight   | .33         | .12       |
| 12                              | Lightweight   | .46         | .25       |
|                                 | Heavyweight   | .46         | .25       |

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# NEW MEXICO SOCIETY OF ARCHITECTS

## Schedule of Recommended Fees

### for compensation related to construction costs

*This schedule applies to all structures similar to respective types listed, and represents a fair fee below which adequate architectural services cannot be expected. Percentages are based on Project Construction Cost as defined in "Standard Form of Agreement Between Owner and Architect."*

#### FEEES FOR BASIC SERVICES

| CONSTRUCTION COST           | GROUP A | GROUP B | GROUP C | GROUP D | GROUP E |
|-----------------------------|---------|---------|---------|---------|---------|
| UP TO \$50,000.....         | 7.5%    | 8.0%    | 8.5%    | 9.0%    | 12.0%   |
| 50,000 TO 100,000.....      | 7.0%    | 7.5%    | 8.0%    | 8.5%    | 10.0%   |
| 100,000 TO 300,000.....     | 6.0%    | 7.0%    | 7.5%    | 8.0%    | 9.0%    |
| 300,000 TO 1,000,000.....   | 6.0%    | 7.0%    | 7.0%    | 8.0%    | - - -   |
| 1,000,000 TO 3,000,000..... | 5.0%    | 7.0%    | 7.0%    | 7.0%    | - - -   |
| OVER 3,000,000.....         | 5.0%    | 6.5%    | 7.0%    | 7.0%    | - - -   |

FOR PROJECTS OF INTERMEDIATE VALUE, PERCENTAGES MAY BE INTERPOLATED.

Group A—Simplified Utilitarian Building, such as:  
lofts, warehouses, parking garages.

Group B—Conventional Character, such as: private  
and public schools and colleges, office buildings,  
banks, hotels, apartments, motels, stores, recrea-  
tional buildings, public buildings, dormitories,  
fire stations, shopping centers, factories and in-  
dustrial armories.

Group C—Complex Buildings, such as: restaurants,  
transportation terminals, libraries, museums,  
broadcast facilities, newspaper and printing  
plants, mortuaries, auditoriums and theaters,  
churches and synagogues, doctors' offices, laun-  
dries.

Group D—Specialized, Complicated Buildings, such  
as: hospitals, clinics, laboratories, penal buildings,  
sanitaria, mental institutions.

Group E—Single Family Residences.

State and municipal sales taxes are to be added to  
all fees.

The above fees apply to lump sum, single contractor  
contracts. Add the following percentages to the  
basic fee when these conditions are involved:

- (1) When more than one contract is to be  
awarded for construction, add one percent  
(1%) to the appropriate fee.
- (2) When a cost plus fee contract is to be  
awarded for construction, add one percent  
(1%) to the appropriate fee.

(3) When cost plus fee contracts are to be  
awarded to more than one contractor, add  
two percent (2%) to the appropriate fee.

(4) For alterations and/or additions to existing  
structures, a minimum of one-fourth ( $\frac{1}{4}$ )  
the basic rate should be added. This rate  
should be increased by a greater amount for  
historic restorations.

#### PAYMENT FOR REIMBURSABLE SERVICES

Payment for reimbursable services as described in  
the current editions of "Services of the Architect" and  
AIA Document B131 "Standard Form of Agreement  
Between Owner and Architect" should be computed  
at actual cost.

#### PAYMENT FOR ADDITIONAL SERVICES

Payment for additional services as described in the  
current editions of "Services of the Architect" and  
AIA Document B131 "Standard Form of Agreement  
Between Owner and Architect" should be computed  
as follows:

- (1) Principals' time at agreed fixed rate per  
hour.
- (2) Payroll cost of employees multiplied by a  
factor to cover overhead and fee. The fac-  
tor normally should range from  $2\frac{1}{2}$  to  $3\frac{1}{2}$   
depending on the nature of the project and  
scope of services.
- (3) Additional services of professional consul-  
tants at an agreed multiple of the amount  
billed the architect.

Recommended fee schedules are developed from time  
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ican Institute of Architects in Washington.



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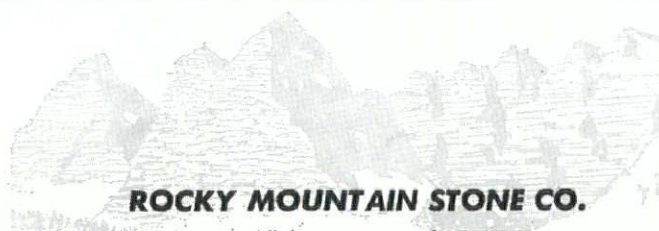
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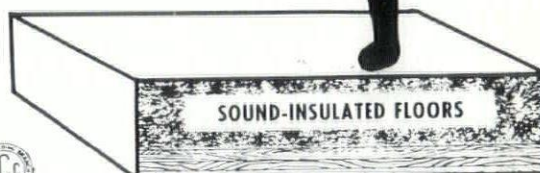
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## 10 Years 10

With this issue the "editorial staff" completes its tenth year of association with **New Mexico Architecture** magazine.

The September-October, 1960 issue of NMA contained a simple announcement —

New Editors for the **NMA**. With this issue the **NMA** enters an interim under new editors. John Conron and Bainbridge Bunting jointly will serve as editors during the year's absence of Dr. David Gebhard. David has taken a leave of absence from his post as director of the Roswell Museum to teach on a Fulbright appointment — architectural design and history at the University of Istanbul."

That "interim" period has lasted a little longer than the expected one year! David did return to the United States upon completion of his teaching assignment in Istanbul, but he landed at the University at Santa Barbara, California, rather than in Roswell, New Mexico.

The June issue of **Symposia** magazine wishes itself a Happy Fourth Birthday, and releases the statistic that "four years of **Symposia**—laid end to end—measures exactly forty-four linear feet." I can only counter with the deflating fact that 10 years of **New Mexico Architecture** measures some 7½ inches standing on the bookshelf.

It has been 60 challenging issues and ten fascinating years. And now on to the September-October issue and year eleven.

**John P. Conron AIA/AID**

### Contributor to this issue . . .

*Harvey Mudd II, a rancher in Arroyo Hondo, Taos County, a member of the state board of New Mexico Citizens for Clean Air and Water, and a Board Member of the John Muir Institute, came to*

*New Mexico five years ago from New York City. The quality of New Mexico's environment was a major reason for his coming to the state. For further information write to Box 748, Arroyo Hondo, New Mexico 87513.*

### new mexico architecture nma

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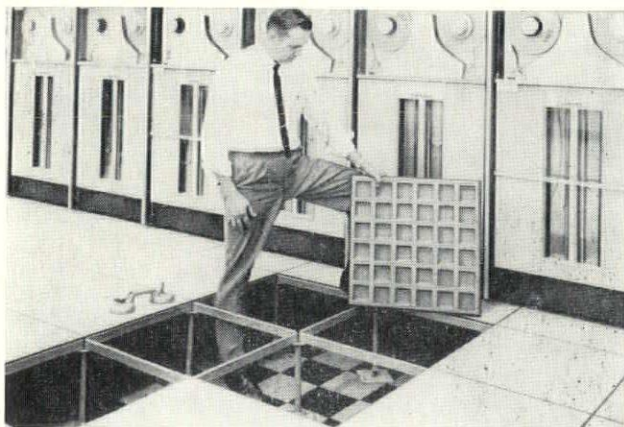
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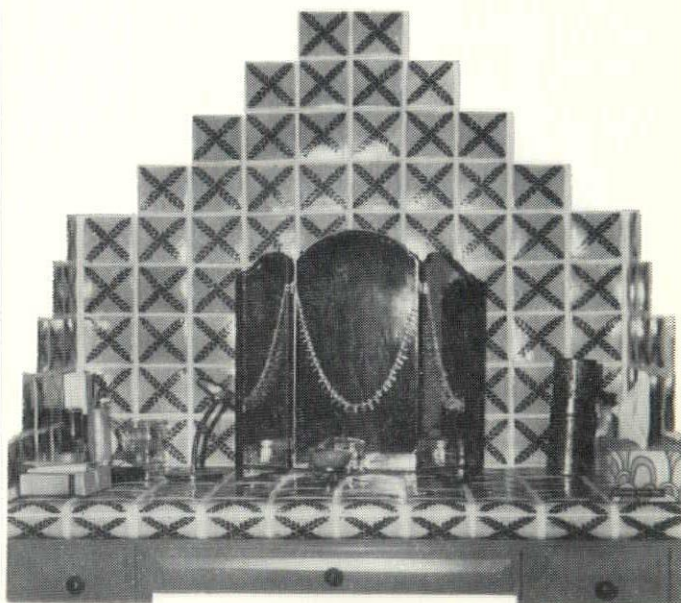


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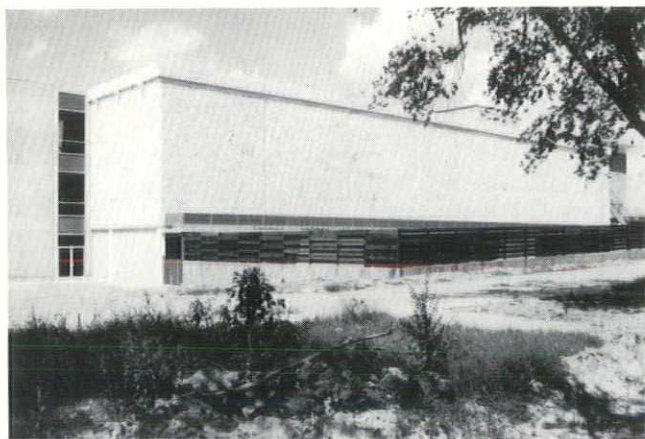
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